

THE GENUS *MACROCHELES* LATREILLE (ACARINA: MACROCHELIDAE) IN INDIA* MORPHOLOGICAL VARIATIONS AND GEOGRAPHICAL DISTRIBUTION¹

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(With five text-figures and one plate)

Key words: Acarina, *Macrocheles* sp., habitat, morphological variation, distribution

Data pertaining to habitats and geographical distribution of five species of *Macrocheles* Latreille, viz. *peniculatus* Berlese, *penicilliger* (Berlese), *krantzi* Evans and Hyatt, *merdarius* (Berlese) and *muscaedomesticae* (Scopoli) are presented. Morphological variations observed in the first two species are discussed with illustrations.

INTRODUCTION

This part of the series documents the data pertaining to habitats and geographical distribution of five species of *Macrocheles* Latreille, viz. *peniculatus* Berlese, *penicilliger* (Berlese), *krantzi* Evans and Hyatt, *merdarius* (Berlese) and *muscaedomesticae* (Scopoli) from India. Morphological variations observed in *peniculatus* and *penicilliger* are discussed and illustrated. Of the five aforementioned species, *peniculatus* was earlier reported in Part 2 of the series (Roy 1991 a). The remaining are known through the works of Evans and Hyatt (1963), Pramanik and Raychaudhuri (1968), Pramanik (1977), Sharma and Sharma (1973) and Singh and Kapoor (1976). This paper incorporates additional information on habitats.

Unless otherwise indicated, the collector was this author. The material has been deposited in the Zoological Survey of India, Calcutta. The altitudes given are approximate.

1. *Macrocheles peniculatus* Berlese, 1918 (Figs. 1-2; Pl. 1: Fig. 1)

Macrocheles (*Coprholaspis*) *peniculatus* Berlese, 1918, *Redia* 13: 166.

Macrocheles vicarius Berlese, 1918, *Redia*, 13: 167

Macrocheles caelatus: Ramsay, 1970, *N. Z. Entomologist*, 1: 91;

Emberson, 1973, *N.Z. Entomologist*, 5: 119 (not Berlese, 1918) misidentification.

Macrocheles peniculatus: Ghilyarov and Bregetova, 1977 (Nauka, Leningrad): Wallace, 1986, *Acarologia*, 27 (1): 11.

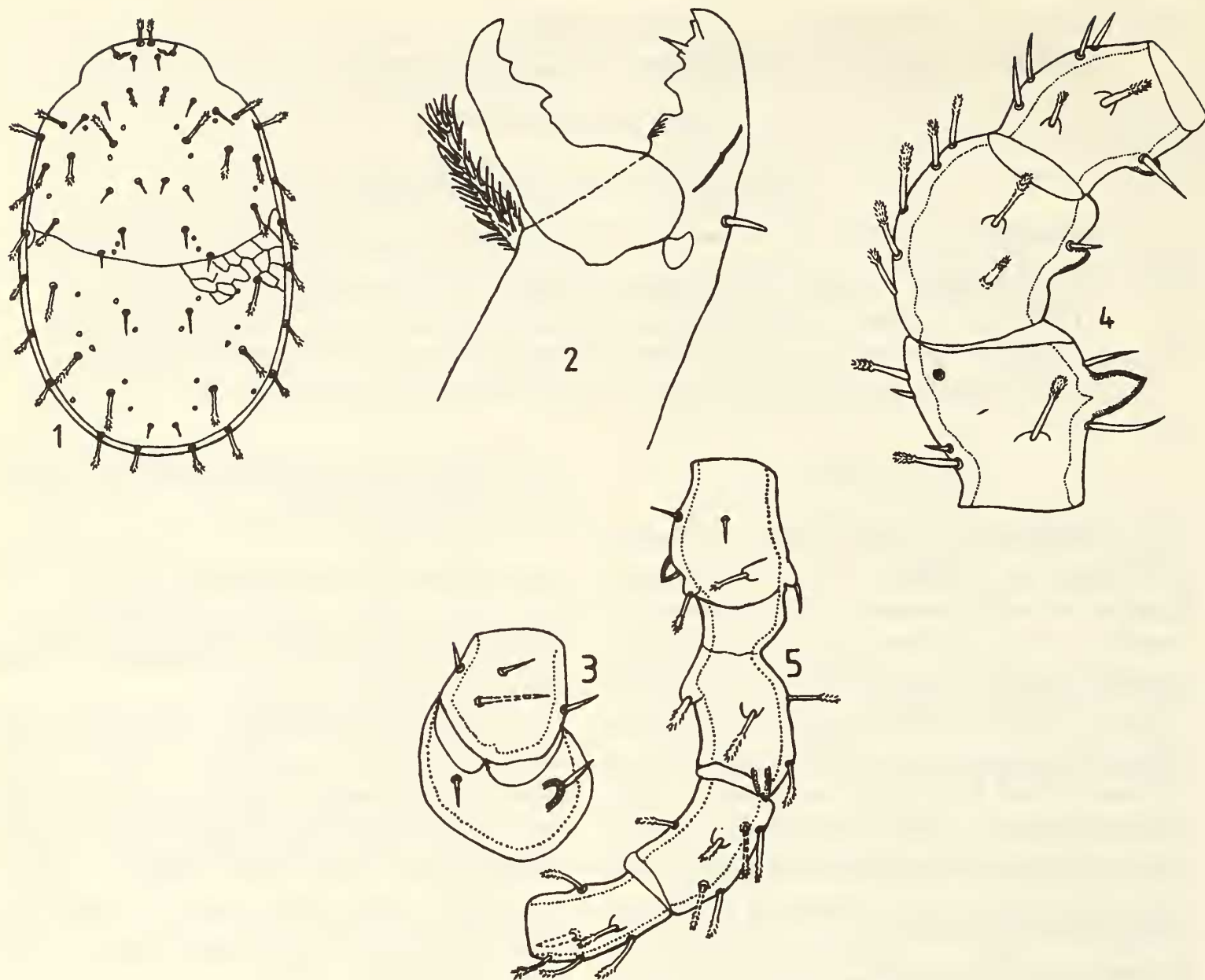
Material examined: 5 females, Tamil Nadu: Palni Hills: Kodaikanal - 2450 m, 12.iii. 1980, ex dung heap; 1 female, Kodaikanal lake area, 12.iii. 1980, ex decaying grasses; 2 females, Nilgiri Hills: Ootacamund, Botanical Garden, 16.iii.1980 ex dung heap; 1 female, Ootacamund, 16.iii.1980, ex pine leaf litter; 1 female, Nilgiri Hills: Aruvankadu - 2000 m, 18.iii. 1980, ex pine leaf litter; 2 females, Nilgiri Hills: Pykara -2290 m, Royal valley, 10.iii. 1980, ex pine leaf litter.

Distribution: Originally described as an ant nest associate from La Plata, Argentina in South America (Berlese, 1918). Krantz (1970) recorded the species from Natal (South Africa). Wallace (1986) collected the species from a number of dung beetles in Australia. Krantz and Filipponi (1964) reported a female of *M. peniculatus* from Australia. According to Wallace (*op. cit.*), the record was an error and the actual locality of that specimen is Otaki, north of Wellington, New Zealand. Previous records of *M. caelatus* Berlese, 1918 from New Zealand by Ramsay (1970) and Emberson (1973) are misidentifications of *M. peniculatus* (Emberson,

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Figs. 1-5: 1. Dorsal shield, *Macrocheles peniculatus* Berl., female;
 2. Chelicera, *Macrocheles peniculatus* Berl., female; 3. Coxa II, *Macrocheles penicilliger* Berl., male;
 4. Femur, genu and tibia of leg II, *Macrocheles penicilliger* Berl., male;
 5. Trochanter, femur, genu and tibia of leg IV, *Macrocheles penicilliger* Berl., male.

1980). European records are from USSR (Bregetova and Koroleva 1960), Ghilyarov and Bregetova 1977) and Hungary (Eröss and Mahunka 1971). Costa (1966) recorded it from Israel. In India, it is confined to the southern region. Records indicate that the species is well represented in the southern hemisphere.

Remarks: The species has been described and illustrated by Bregetova and Koroleva (1960). The material at hand conforms to the description and illustration given by Bregetova and Koroleva (*op. cit.*) except for the presence of a procurved medial line and dorsal seta (s4)

being simple (Fig. 1). In addition, the movable digit of chelicera (Fig. 2) is tridentate in contrast to the bidentate nature of the digit in the European counterpart, as depicted by Bregetova and Koroleva (1960). It was reported earlier from Kodaikanal by Roy (1991a, b).

2. *Macrocheles penicilliger* (Berlese, 1904) (Figs. 3-5; Pl. 1; Figs. 2-3)

Holostaspis penicilliger Berlese, 1904, *Redia*, 1: 264 *Macrocheles* (*Coprholaspis*) *penicilliger* Berlese, 1918, *Redia*, 13: 146.

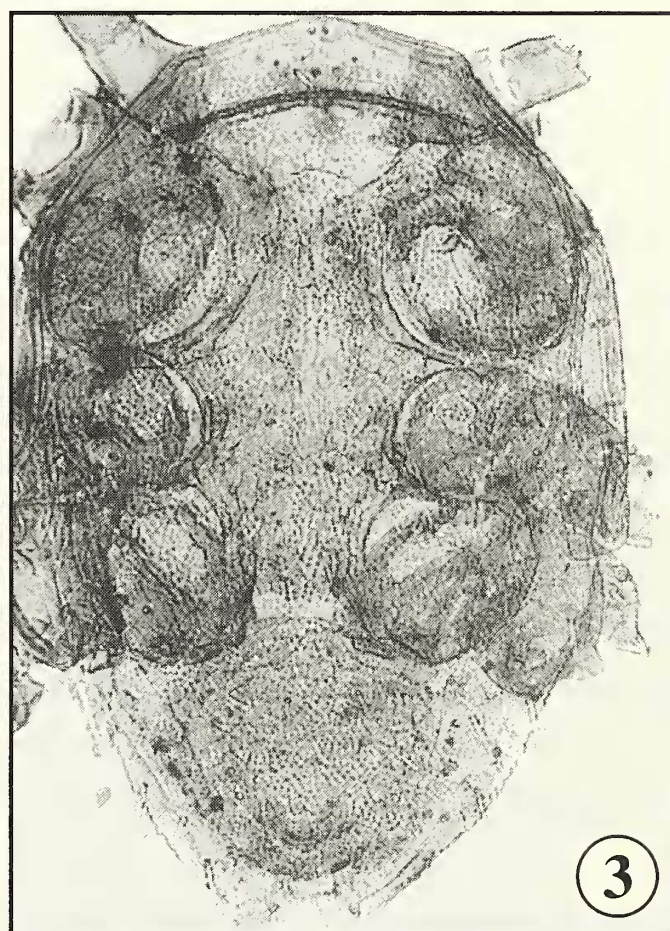
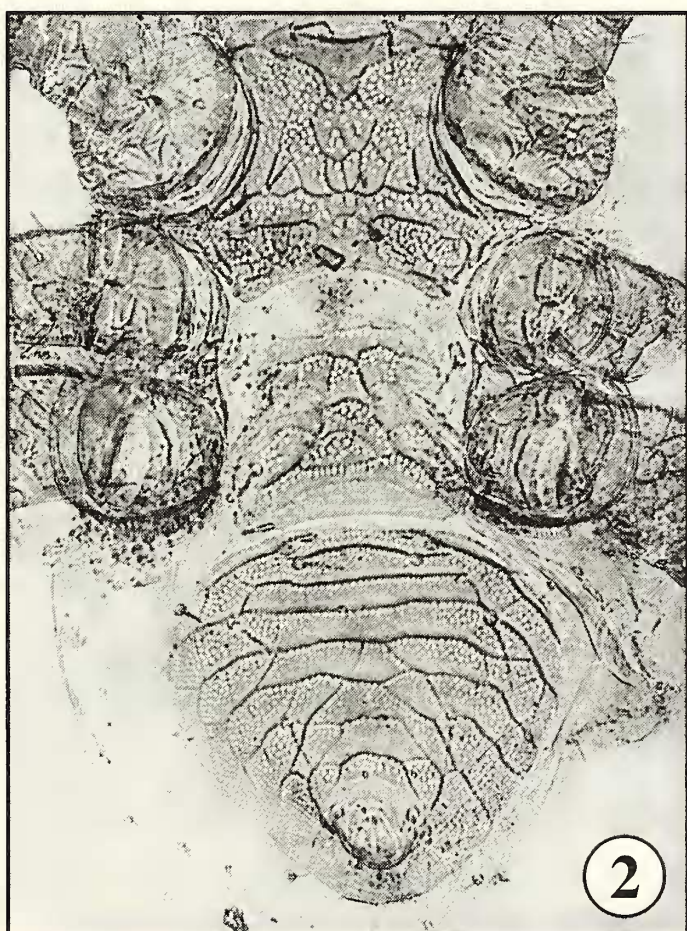
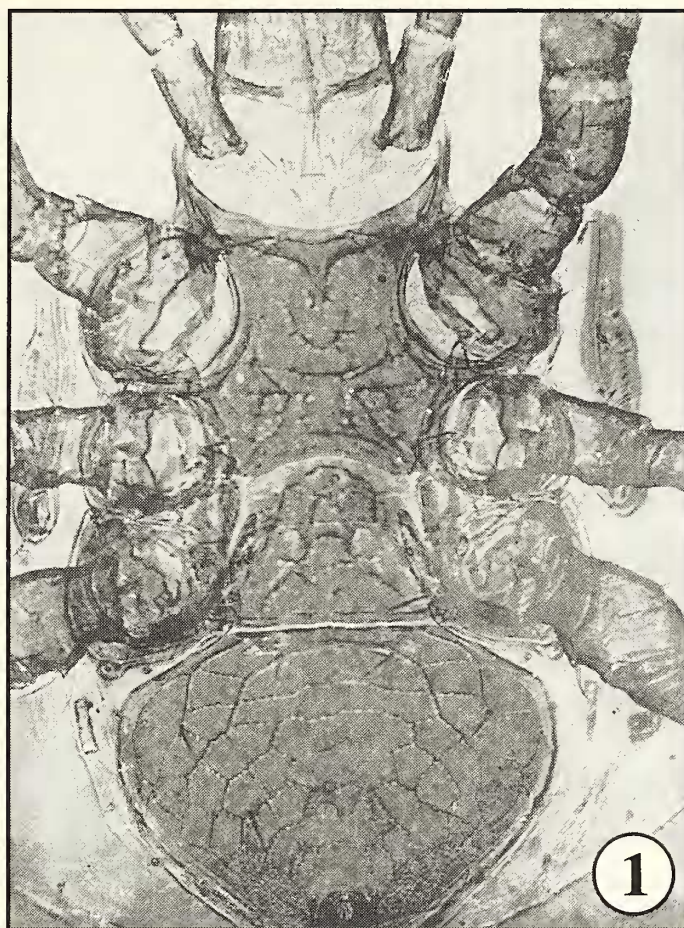


Fig. 1. Ventral shields of *Macrocheles peniculatus* Berl., Female (82 X);
Fig. 2. Ventral shields of *Macrocheles penicilliger* (Berl.), Female (136 X);
Fig. 3. Ventral Shields of *Macrocheles penicilliger* (Berl.), Male (94 X)

Macrocheles penicilliger: Bregetova and Koroleva, 1960, *Mag. Parasit. Sbornik. Zool. Inst.* 19: 86.

Macrocheles (Macrocheles) penicilliger Krauss, 1970, *Acarologie Sch. vergl. Milbenk*, 14: 18.

Material examined: 7 females, Manipur: Imphal -780 m, War Cemetery, 31.xi.1973, ex decaying leaf litter; 8 females, Meghalaya: Khasi Hills: Shillong -1300 m, lake area, 8.vi.1974, ex soil litter; 6 females, Shillong, Trevors Lane, 13.vi.1974, ex soil litter; 1 female, Shillong, Umpling, 8.vi.1974, ex grassy soil; 2 females, Shillong, lake area, 11.vi.1974, ex leaf litter; 4 females, Shillong, Umpling, 8. vi. 1974, ex pine leaf litter; 1 female, Meghalaya: Garo Hills: Tura-370 m, 15.iii.1974, ex decaying grasses; 1 female, Bonsomgiri, 14.iii.1977, ex decaying wood; 2 females, Sikkim: Gangtok-1500 m, 10.xi.1973, ex decaying litter of *Bambusa* sp.; 123 females, Gangtok, Sundarigaon, 11.xi.1973, ex soil mixed with dung; 1 female, Gangtok, near White Memorial Hall, 9.xi.1973, ex decaying heap of grasses; 17 females, Gangtok, 12.xi.1973, ex cultivated soil mixed with dung; 2 females, Tamil Nadu; Nilgiri Hills: Coonoor - 2090 m, ex pine leaf litter; 1 female, Pykara -2290 m, 10.iii.1980, ex pine leaf litter; 2 females, Ootacamund -2218 m, Botanical Garden, 16.iii.1980, ex humus soil; 1 female, Pykara, Royal Valley, 10.ii.1980, ex soil litter; 1 female, Palni Hills; Kodaikanal-2450 m, lake area, 10.iii.1980, ex dung mixed with straw; 3 females and 2 males, Uttar Pradesh: Garhwal Hills: Pauri -775 m, Stn. No. 10, 25.xi.1977, ex leaf litter. S.K. Gupta and Y.N. Gupta coll.; 3 females, Kumaon Hills: Nainital -1985 m, 11.xi.1977, ex leaf litter, S.K. Gupta and Y.N. Gupta coll.; 9 females, Nainital, near Nainital Lake, 16.xi.1977, ex rotten grasses, Y.N. Gupta coll.; 23 females, Almora -1645 m, 9.x.1976, ex leaf litter; 5 females, Kumaon Hills: Kausani -1800 m, 13.x.1976, ex pine litter; 1 female, Almora, Chitoli Reserve Forest, 9.x.1976, ex decaying heap of grasses; 2 females, Kathgodam

-500 m, 8.x.1976, ex decaying grasses; 1 female Ranikhet -1805 m, Mall Road, 12.x.1976, ex moss; 2 females, Ranikhet -1805 m, Chaubatia Apple Garden, 10.x.1976, ex leaf litter; 3 females, Almora, 9.x.1976, ex leaf litter; 17 females, Eastern Himalaya: West Bengal: Darjeeling -2800 m, Hill Cart Road, 14.xi.1973, ex soil litter; 13 females, Darjeeling, Labong, College Road, 13.xi.1973, ex garbage heap; 22 females, Darjeeling, Botanical Garden, 13.xi.1973, ex decomposed grasses and leaves; 39 females Darjeeling, Mall area, 15.xi.1973, ex rubbish heap; 2 females, Selimbong, 7.xii.1977, ex soil with pine litter, R.K. Ghosh Sr. ZSI Coll.; 1 female, Dow Hills: Kurseong-2350 m, 13.v.1979, ex pine litter, M.S. Shishodia *et al.* ZSI Coll.

Distribution: *M. penicilliger* is frequently encountered in Europe: Italy (Berlese 1904), England (Evans and Browning 1956), Austria (Franz 1954), Hungary (Eröss and Mahunka 1971), Iceland (Selnick 1940), USSR (Bregetova and Koroleva 1960), Germany (Krauss 1970). Pramanik and Raychaudhuri (1978) first recorded females of *M. penicilliger* from India: The species is an exotic in India, away from its Palearctic homeland and is widely represented. India. Manipur, Meghalaya, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. This species was first recorded from West Bengal (Pramanik and Raychaudhuri 1978). Others are new records.

Remarks: In recent years the species has been redescribed by Evans and Browning (1956) and by Bregetova and Koroleva (1960), based on material collected in England and USSR. Indian material conforms with the European material. Pramanik (1977) provided collection data from West Bengal, with measurements of female. Males are recorded here for the first time. Bregetova and Koroleva (*op. cit.*) illustrated both the sexes. The nature of spurs and ridged setae on legs II and IV in male in Indian material differs from USSR specimens as illustrated by these authors. Segments of legs II and IV in

male, bearing spurs and ridged setae, are illustrated in Figs. 3-5. Coxa II bearing sclerotised ridge (Fig. 3); femur, genu and tibia of leg II spurred (Fig. 4). Segments of leg IV provided with plumose and ridged setae (Fig. 5); trochanter and femur IV with spurs (Fig. 5).

3. *Macrocheles krantzi* Evans and Hyatt, 1963.

Macrocheles krantzi Evans and Hyatt, 1963, *Bull. Brit. Mus. (Nat.) Hist.*, 9: 351.

Macrocheles krantzi (7) Krantz and Filipponi, 1964, *Riv. Parass.*, 25(1): 44

Not *Macrocheles krantzi*, Anwarullah and Irshad, 1971, *Sind Univ. Res. J. (Sci. Ser.)*,: 145. (misidentification).

Macrocheles krantzi: Wallace, 1986, *Acarologia*, 27(1): 12.

Material examined: 1 female, Assam: Nowgong dist. Lumding, 29.xii.1973 ex goat dung; 1 female, Karnataka: Bangalore, Entomology Museum, University of Agricultural Sciences, coll. date and coll. not listed, ex *Scarabaeus brahminus* Cast.

Distribution: Australia (Krantz and Filipponi 1964, Wallace 1986), India and Ceylon (Evans and Hyatt 1963). India: Assam (new record), Karnataka (new record) and Tamil Nadu.

Remarks: This species was originally described by Evans and Hyatt (1963) from specimens collected from *Scarabaeus brahminus* Cast. at Namakal, Salem (Tamil Nadu) and *S. erichsoni* Harold at Colombo (Sri Lanka) respectively, both the beetles are represented in the British Museum collections. Subsequently Krantz and Filipponi (1964) reported three specimens from Townsville, Australia, collected off *Onthophagus laminatus* Moll., and assigned dubiously three Australian specimens to *M. krantzi*. Wallace (1986) reported seven additional collections (ex *Onthophagus nodulifer* and *O. laminatus*) from Townsville and Ingham, northeastern Queensland, Australia. Anwarullah and Irshad (1971) described a new species of *Macrocheles* by the name *M. krantzi*. The

description and illustrations of the species provided by them are quite dissimilar to those of *M. krantzi* of Evans and Hyatt and suggest a different species.

4. *Macrocheles merdarius* (Berlese, 1889)

Holostaspis merdarius Berlese, 1889, *Acari Myriapoda et Scorpiones etc.*, 52 (1).

Macrocheles merdarius: Sellnick, 1940, *Goteborg, Vetensk. Samh. Handl.*, (5). 6(B) (14): 86.

Macrocheles merdarius: Evans and Browning, 1956, *Bull. Brit. Mus. (Nat. Hist.) Zool.*, (1): 21; Bregetova and Koroleva, 1960, *Parasit. Sbornik. Zool. Inst.*, 19: 145; Filipponi and Pegazzan, 1963, *Redia*, 48: 83; Krauss, 1970, *Acarologie Sch. vergl. Milbenk*, 14: 17; Wallace, 1986, *Acarologia*, 27(1): 9; not *Macrocheles merdarius* Bhattacharya, 1971, *Orient. Insects*, 5: 498 (misidentification);

Material examined: 2 females Arunachal Pradesh: Tirap dist. Deban, Chakma Bastee 12.i.1981 ex poultry litter; 1 female, Assam: Dibrugarh dist. Dibrugarh, Gosala, 7.vi.1979. ex dung heap; 1 female, Assam: Dibrugarh dist. Digboi, 4.iv.1976, ex dung heap, A.K. Dutta and R.K. Roy coll.; 3 females, Karnataka: Bangalore, Entomology Museum, University of Agricultural Sciences, ex *Copris* sp., coll. date and coll. unlisted; 1 female, Tamil Nadu: Chennai (Madras) Zoo Garden, lake area, 5.iii.1980, ex leaf litter; 7 females, Coimbatore, Tamil Nadu Agricultural University Campus, Central Dairy Farm, 13.iii.1980, ex dung heap; 1 female, Uttar Pradesh: Allahabad dist. Mirapur, 13.xii.1977. ex rotten leaf litter, Y.N. Gupta coll.

Distribution: *M. merdarius* is a nearly cosmopolitan species. The following distribution records are known so far. It occurs widely in Europe: Italy (Berlese 1889, Filipponi and Pegazzano 1963, Rota and Serini 1976); Great Britain (Evans and Browning 1956, Hyatt 1956); USSR (Bregetova and Koroleva 1960); Hungary (Eröss and Mahunka 1971); Bulgaria (Balogh